Inpatient Asthma Education Program

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Asthma is the most common chronic childhood illness and one of the leading reasons children are admitted to the hospital. The disease is manageable, and severe exacerbations are preventable. Yet it remains an enormous burden on the health care system. In the U.S., approximately 23 million people have asthma, including 6.8 million children. An average of 1 out of every 10 school-aged children has the disease (United States Environmental Protection Agency, Indoor Environmental Division, 2009). The purpose of this article is to describe an inpatient asthma education program quality improvement project that uses evidence-based guidelines to provide asthma education to families when a child is hospitalized with an acute asthma exacerbation.

Education

Patient/family education is a key recommendation of the National Heart, Lung and Blood Institute/National Asthma Education and Prevention Program (NHLBI/NAEPP) (2007) guidelines and vital to asthma management (Shah, Roydhouse, & Sawyer, 2008). Advantages of education include patient/parent knowledge, symptom control, fewer exacerbations, and better confidence that symptoms are controlled and will not constrain normal activities (Jones, 2008). An abundance of literature on asthma education programs for adults in outpatient settings is available; however, there is a paucity of information published about inpatient asthma education for parents of children who are admitted to the hospital for acute exacerbations.

In the outpatient setting, educators range from pharmacists to respiratory therapists to registered nurses (RNs) to primary care providers (PCPs). When PCPs are the sole providers of education, there is concern that many are not well informed on current asthma guidelines and recommendations, proper inhalation device techniques, and the use of asthma action plans (AAPs) (Shah et al., 2008). Primary reasons expressed by PCPs for not providing asthma education in the primary care setting include time constraints and poor insurance reimbursement (Toomey, 2009). As shown from the authors’ class evaluation data, approximately 50% of parents reported that the authors’ asthma education program was the first time they received asthma education.

Asthma is the second leading admitting diagnosis at Children’s Hospital Boston (CHB), having an impact on many patients and families annually. To improve education for parents of patients hospitalized with asthma and increase health care providers’ completion of individualized asthma action plans (AAPs), nurse experts established a comprehensive inpatient asthma education program based on the 2007 National Heart, Lung and Blood Institute/National Asthma Education and Prevention Program (NHLBI/NAEPP) guidelines. These guidelines recommend that caregivers teach and reinforce asthma education at every opportunity across the health care continuum. The paradigm of asthma education now embraces approaches that promote self-management (Shah, Roydhouse, & Sawyer, 2008), and AAPs are a key strategy in self-management education (Jones, 2008). The CHB inpatient program, led by the inpatient asthma nurse practitioner (IANP), combines several teaching strategies for parents and facilitates completion of individualized AAPs. Data collected since the start of the program show tremendous improvement in education and compliance with completion of individual AAPs before discharge.

Inpatient Asthma Education Program

The inpatient asthma education program at Children’s Hospital Boston (CHB) is directed by the inpatient asthma nurse practitioner (IANP) and supported by advanced practice nurses (APNs) and registered nurses (RNs). CHB’s asthma education program was developed based on the notion that hospitalization provides a teachable moment. The 2007 NHLBI guidelines recommend that caregivers teach and reinforce asthma self-management education at every opportunity across the health care continuum. Admission to the hospital presents a key teaching opportunity (Jones, 2008). The fear and worry families experience when a child is hospitalized after an emergent asthmatic event is highly motivating and offers a teachable moment in which the desire to learn how to control the asthma and prevent future emergencies becomes strong (Lawson & Flocke, 2008).

The paradigm of asthma education embraces an approach that promotes self-management (Shah et al., 2008). For the purposes of this article, self-management refers to the role of parents in the management of their child’s asthma. The term family/families is used to acknowledge that the child’s asthma affects the whole family; however, the parents are responsible for their child.
**Figure 1.**

**Asthma Action Plan**

**Children's Hospital Boston**

**Asthma Action Plan**

Hospital Service or Clinic: Short Stay Program

Asthma Severity: Moderate Persistent

Seasonal Triggers: 

Triggers: illness

Avoid Smoke Exposure & Viral Illnesses!

**GREEN GO: You’re Doing Well**

- Breathing is good
- No cough or wheeze
- Sleep through the night
- Can go to school and play

Use these medicines every day:

- **Medicine:** Flovent 110 mcg
- **How much:** 2 puffs, inhaled
- **When:** Twice daily

**YELLOW CAUTION: Slow Down**

- First signs of a cold
- Cough
- Mild Wheeze
- Tight Chest
- Coughing, wheezing, or trouble breathing at night

And Take These Medications:

- **Medicine:** Albuterol MDI
- **How much:** 2 puffs, inhaled
- **When:** Every 4-6 hours as needed
- **Take for 7 days**
- **If no improvement in 3 days call the office or come in to be seen.**

**RED DANGER: GET HELP!!!**

Your asthma is getting worse fast:

- Medicine is not helping
- Breathing is hard and fast
- Nose opens wide
- Ribs show
- Can’t talk well

Take this medicine immediately:

- **Medicine:** Albuterol
- **How much:** 2 puffs, inhaled, OR 1 vial via nebulizer
- **When:** May repeat every 20 minutes for a total of 3 doses.

GET HELP FROM A DOCTOR NOW! Or call 911, OR GO TO THE NEAREST EMERGENCY ROOM FOR SEVERE SYMPTOMS!

I give permission for my child’s doctor and the school nurse to talk to each other about my child’s asthma.

Patient/Parent/Guardian Signature: ____________________________ Date: ____________________________

**COMMENTS/SPECIAL INSTRUCTIONS:**

If you are being discharged from the hospital and a follow up appointment has not been scheduled with your primary care provider, please contact your Primary Care Provider within 1 to 3 days at (617) 983-4100 to schedule a follow-up appointment.

I acknowledge my participation, review of, and agreement with the above plan:

Signature: ____________________________ Date: ____________________________

Source: Children's Hospital Boston. Used with permission.
Education directed toward asthma self-management focuses on parent participation. Pediatric patients at a developmental level when they can understand are encouraged to participate and receive education from the IANP. The goal is to help the parent develop the knowledge and skills to avoid triggers, recognize asthma symptoms, and take the appropriate action related to day-to-day care and exacerbations. AAPs are a key strategy of asthma self-management education (Jones, 2008). Written AAPs are individualized for each patient and include instructions for 1) daily management, and 2) recognizing and handling worsening asthma, including self-adjustment of medication in response to acute symptoms or changes in peak flow values. AAPs reinforce self-management at all points of care (see Figure 1).

The opportunity for families to learn asthma self-management skills during hospitalization of their child increases their ability to manage their child’s asthma at home in collaboration with their primary care providers (PCPs), asthma specialists, and other outpatient providers. This, in turn, reduces unscheduled acute care visits, unnecessary hospitalizations, missed school and work days, and health care costs (NHLBI/NAEPP, 2007; Tolomeo, 2009). Moreover, if symptoms are controlled, patients will enjoy a better quality of life.

Group Curriculum

APNs provide group education for families that supplement the education staff nurses provide as they care for their patients throughout the day. Group education is interactive, and allows plenty of time for questions, answers, and sharing stories so participants can learn from each other as well as the educator. One major benefit of group education is the sharing of stories. Networking with other parents provides a social construct for validating personal experiences and solving asthma management problems (Tolomeo, 2009). Parents share stories at all levels (age and acuity) and learn from each other’s questions.

Educational Content

The outline for educational content (developed by a panel of asthma subject matter expert APNs) is based on recommendations from NHLBI/NAEPP guidelines. Key educational messages delineated by the organization’s expert panel report are:

- Basic facts about asthma.
- The role of medications.
- Skills needed to monitor symptoms and administer medications.
- Environmental control measures.
- Daily self-management and measures to adjust for changes in patient condition.

Teaching Strategies

APNs use a variety of teaching strategies to meet the individual needs of families living with asthma. Demonstration devices, such as inhalers, holding chambers, and peak flow meters, are provided to teach and allow families to practice psychomotor skills. These skills are reinforced by bedside RNs who demonstrate medication administration techniques (teach back, return demonstration) then observe families giving a return demonstration. APNs use visual aids, such as anatomical charts of the respiratory system, large poster boards illustrating various controller and rescue medications, and a standard AAP. The IANP strives to have patients’ individualized AAPs completed prior to the class so each family has a plan to refer to during the educational session.

Each family receives an educational booklet, *Take Charge of Your Asthma*, which is available in English and Spanish. Information is written at a fifth grade reading level based on health literacy recommendations. Although most adults read at an eighth grade level, simplifying patient educational materials so they are written at a fifth grade level or lower increases comprehension to meet the needs of the 20% of the population that reads at or below the fifth grade level. Both written materials and verbal explanations are short, clear, and simple (Safeer & Keenan, 2005). Other educational resources include a DVD of the asthma class, which is available for families to view at a convenient time. CHB’s inpatient Asthma Channel runs on a loop on televisions in patient rooms. Topics covered include information on the basics of asthma, triggers and environmental control, warning signs, medications, and delivery devices. Some segments are geared toward parents, while others appeal to children.

Setting

Family asthma classes are held in the family resource room (FRR) once or twice daily Monday through Friday depending on the volume of hospital-ized patients with asthma. The FRR is a non-threatening, distraction-free environment conducive to learning. It is a quiet place where parents can relax, sip coffee, meet other parents, and learn. The room is staffed by a patient and family educator, and contains brochures, books, games, computers, and more, all designed to provide an environment conducive to learning. The hospital provides light snacks and coffee, and parents are encouraged to bring their lunch. The IANP markets the class by sending daily emails and posting flyers around the hospital. Nursing and medical staff inform families about the classes each morning and strongly encourage them to attend. Child life specialists assist with arranging volunteers to play or sit with young children, while parents and older children attend class.

Role of the Inpatient Asthma Nurse Practitioner

Asthma Action Plans

The IANP collaborates with allergy, pulmonology, critical care, and general medicine teams throughout the institution on units where asthma patients are admitted. The IANP assesses each patient’s asthma control, makes recommendations, and completes the majority of individualized AAPs. For patients requiring less involvement, the IANP facilitates the completion of AAPs by providing ongoing support and education to nursing and medical staff. The IANP teaches them how to develop AAPs and enforces the standard that all patients with asthma must be discharged home with an AAP.

Follow Up

The IANP follows up with families individually after class to answer any questions they may have, ensuring families’ understanding of their child’s medications, correct follow up of medication administration technique, and comprehension of their individualized AAP. At this time, the IANP involves children in the education if they are developmentally ready and interested in learning.

One-to-One Education

The IANP provides tailored one-to-one education for families who do not attend class. It is important to understand that families who avoid asthma class do so for a reason. Group education is not ideal for everyone. It is the nurse’s responsibility to identify families’ needs and goals, and meet
them where they are. Parents as adult learners bring with them a wealth of life experiences; they are goal-oriented and self-directed, so it is important to emphasize how the new knowledge will be of value and relevant to them (Tearl & Hertzog, 2007). A plan for home care focuses on the patient’s experience of the situation rather than pathophysiology. It is important not to overload families with too much information (Seligman et al., 2007). Families who are ready for more information ask for it. Collaborating with the multidisciplinary teams, the IANP assesses each family’s unique circumstances in order to tailor education accordingly. Interpreters, social workers, child life specialists, and other educators assist with individual needs and providing support.

Staff Education

Inpatient asthma education extends to inpatient nursing and medical staff both formally and informally. When novice nurses and interns are primarily responsible for the assessment and care of patients with asthma, the IANP provides guidance, support, and expertise in clinical assessment and management. The IANP uses daily rounds as an opportunity to assess each patient’s clinical status with the team, as well as review therapies and medications to ensure that inpatient asthma management is based on the evidence-based Asthma Clinical Practice Guidelines of CHB, as well as the NHLBI/NAEPP National Guidelines. The IANP works closely with interns and nurses at the bedside throughout the day, case by case to assist with clinical care and act as a mentor regarding family education.

Assessment of Outcomes

Class Evaluations

A seven-question, written, yes/no, multiple choice, and fill in-the-blank evaluation of satisfaction with the session, developed by the APNs who teach the class, is completed by parents at the end of each class. Feedback collected from 156 parents between 2009 and 2010 was very positive. In 2009 and 2010, an average of 93% of parents reported learning something new (see Figure 2). Among the comments, parents reported that having a quiet place away from distractions, sharing experiences with other parents, and feeling highly motivated by the acuity of the illness were reasons they viewed the class as helpful and unique compared with other educa-
Asthma Action Plans

The IANP completes the majority of individualized AAPs, in addition to guiding and directing other health care providers to do the same. Monitoring the presence of these online AAPs for asthma discharges, the IANP at CHB has seen significant improvement in health care providers’ completion of AAPs. In 2009/2010, the hospital achieved 95% compliance with completion of AAPs.

Future Assessment Plans

Although the post-class evaluations have shown a high rate of satisfaction with asthma class, and parents report they learned something new, the evaluations have not measured knowledge acquisition. Likewise, audits have shown consistent improvement in completion of AAPs and incorporation of education of individualized AAPs in classes for families. However, follow-up evaluation of families’ ability to understand the plan and adhere to it has not been measured. Future quality improvement efforts will focus on capturing knowledge acquisition (with a pre- and post-test), as well as the effect of education on asthma control (ACT test) quality of life (missed school and work days) and readmission rates.

Challenges in Implementing The CHB Asthma Education Program

Attendance

APNs encounter many challenges when recruiting parents/families with unique and diverse needs for the asthma class. Literacy problems, emotional issues, and social concerns can be barriers that negatively affect a person’s ability to learn (Tearl & Hertzog, 2007). Patients and parents with health literacy problems are less likely to understand and participate in disease prevention and health promotion programs. Families can be embarrassed about their inability to read and comprehend written instructions. Thus, they may shy away from asking their provider to clarify information (Safeer & Keenan, 2005). Parents’ preoccupation with concerns about other children at home or worries about finances can be additional barriers to learning.

Other common obstacles include parents who wish to remain at their...
child’s bedside, those unable to leave the patient room because of infection control restrictions, and those with language barriers. Tolomeo (2009) identified time constraints, lack of interest, and poor understanding of the importance of education in asthma management as reasons for patients’ and families’ failure to participate in education programs.

Subject Matter

CHB group classes are geared toward parents and encompass the basic concepts of asthma to reach a broad range of parents/families with diverse psychosocial, educational, and other individual needs. The AAPs follow an outline to ensure that the most important components of asthma education are covered. However, the individual teaching styles of the educators and learning styles and needs of each parent/family vary. Following up with parents/families one-on-one after class to clarify important points and answer individual questions are key components of asthma education. Attending the asthma class is useful only if the family understands what was taught and how it applies to the family’s individual situation.

In the existing program, the IANP provides one-to-one class follow-up and tailored one-to-one education for parents who do not attend asthma class. Challenges are largely related to a lack of available resources to educate a high volume of patients with unique learning needs who are hospitalized for a variety of services on multiple units throughout the institution. It has become clear that CHB needs to build a team of asthma educators to meet these diverse educational needs.

Although CHB has developed a children’s book about asthma, staff have identified a need to develop a more comprehensive education program geared toward children. Tailoring education to meet a broad range of ages and developmental levels presents another challenge that will require more educators and resources.

CHB is exploring avenues for additional asthma educators and other educational resources to support and expand on the education currently provided by the IANP. Providing training sessions for RNs, recruiting unit-based asthma champions, and designating certified asthma nurse educators for the sole purpose of providing asthma education to families are some solutions under discussion.

CHB is in the process of revising educational tools, such as the asthma closed-circuit TV channel and the asthma class DVD, as well as developing new and innovative entertainment and child-focused educational tools.

Discussion

Asthma education is an essential component of asthma management, and AAPs are a key strategy for self-management education. The AAP should be reviewed and reinforced at all points of care across the continuum. Hospitalization is a particularly useful time when the family is highly motivated by a critical experience. It provides an opportunity to educate and reinforce the use of the AAP as a vital tool for managing asthma symptoms. Completing and updating the AAP at each encounter, as well as reviewing it with the family, assist in maintaining continuity of care and ensuring that everyone involved in the patient’s care, including the patient, is working from the same management plan. The AAP can be reviewed and refined at each follow-up visit.

Still early in its development, the comprehensive Inpatient Asthma Education Program at CHB has shown quality improvement in the provision of inpatient family asthma education and completion of individualized AAPs. More in-depth evaluation, including formal research, is necessary to show a direct correlation between asthma self-management education using AAPs as a key tool and their effect on asthma control and readmission rates. Quality of life (missed school and work days) is difficult to measure without following patients over time. Perhaps a collaborative effort with outpatient providers would yield this information.

The IANP has played the key role in the completion of AAPs and education for patients hospitalized for asthma. The IANP provides continuity and high quality care that is difficult to maintain in a teaching hospital where teams rotate frequently and patients with asthma are hospitalized on a variety of services and inpatient units. Moving forward, it will be necessary to continue to build a support system that includes physicians and certified educators dedicated to the success of inpatient asthma care.

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